

On Books

Science and Human Behavior: A Review of William Baum's *Understanding Behaviorism: Behavior, Culture, and Evolution* (2nd ed.)

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Generally speaking, behavior analysts are acutely aware of the need for increased communication with those in other fields about the characteristics and achievements of behavior analysis. This awareness may be most acute among those of us who have regular contact with those in various areas of psychology, philosophy, communication, computer science, and other fields.

Recently, a particularly salient indicator of how far we have to go in making our work clear to others arrived in the mail. It was a complimentary copy of a small book of “classic readings” in the history of the various subfields of psychology. Noticing that a paper by Watson had been included in an early part of the book, I looked ahead to the section on “Learning” to see if behavior analysis was represented through a paper by Skinner, for example. Thirty years of reading and discussion with critics had, I believed, immunized me from whatever absurdity I might find there, but I soon found myself staring at the “classic paper” in the field of learning: Chomsky's (1959) review of Skinner's (1957) *Verbal Behavior*. The review was a polemic that not only hopelessly misrepresented Skinner's systematic interpretations of verbal phenomena and that is not only hopelessly out of date regarding the

respective research fortunes and fates of Chomsky's theory and Skinner's analysis of verbal behavior, but that might also be regarded as a misguided indictment of the entire field of learning.

There are a variety of ways in which behavior analysts might reach out to other fields and to the general public. One way, of course, is to expand the literature of general, introductory, or semipopular treatments of the field. There is a great deal of explaining and describing to do to correct the remarkably persistent set of misperceptions surrounding behaviorism in general and behavior analysis in particular (e.g., Friman, Allen, Kerwin, & Larzelere, 2000; Leigland, 2000; Robins, Gosling, & Craik, 1999).

The recent second edition of William Baum's *Understanding Behaviorism: Behavior, Culture, and Evolution* (2005) is an excellent example of an accessible and comprehensive introduction to behavior analysis. The new edition is a refinement of the original work, *Understanding Behaviorism: Science, Behavior, and Culture* (1994). The small change in subtitle calls attention to expanded and clarified connections between behavior analysis and evolutionary concepts in the new edition.

The overall structure and layout of the book are the same as the original, but the new edition includes some changes in style and emphasis. For example, beyond the broader and clarified relations to evolution, this

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edition also expands the role of the molar analysis of behavior (emphasizing temporally extended contingencies and activities; e.g., Baum, 2002), although the more traditional molecular analysis (emphasizing temporally contiguous relations between momentary events) is given fair treatment throughout. The new edition also increases readability for nontechnical audiences by making greater use of ordinary-language terms in illustrations and examples. Like the first edition, the book is divided into four sections, each of which will serve as the basis for comments below.

Radical Behaviorism

Part 1, “What is Behaviorism?,” lays the conceptual groundwork for the scientific analysis. A concise history of scientific psychology provided in chapter 1 (“Behaviorism: Definition and History”) leads to Watson’s early behaviorism. A description of two of the diverse views that would eventually fall under the heading of *behaviorism* begins with Baum’s (2005) observation that

This science of behavior that Watson envisioned would use none of the traditional terms referring to mind and consciousness, would avoid the subjectivity of introspection and animal-human analogies, and would study only objectively observable behavior. Yet even in Watson’s own time, behaviorists debated over the correctness of this recipe. It was unclear what *objective* meant or exactly what constituted *behavior*. Since these terms were left open to interpretation, behaviorists’ ideas about what constitutes science and how to define behavior have varied. (p. 11)

Important differences among the varieties of behaviorism have been the source of profound confusions among psychologists, philosophers, linguists, and others. The issues are obviously complex, but Baum’s focus on differing interpretations of *objectivity* and *behavior* forms the basis for distinguishing between methodological behaviorism and radical behav-

iorism, a distinction more fully developed in chapters 2 and 3.

Chapter 1 also includes an examination of the concepts of free will and determinism. Presented as a conflict that cannot be resolved by empirical evidence, the critical review of the ontological, or libertarian, version of free will (the position that choices can be free of history and genetics) makes the case that a scientific analysis of human behavior can proceed without the concept, although its use in ordinary language might have functional or phenomenological significance in some areas of discourse.

Chapters 2 (“Behaviorism as a Philosophy of Science”) and 3 (“Public, Private, Natural, and Fictional”) describe the properties of radical behaviorism as the systematic scientific perspective, or “philosophy of science,” of behavior analysis. Chapter 2 contrasts methodological behaviorism with radical behaviorism. Baum’s method of presenting this contrast is through an identification of methodological behaviorism with a generic philosophical version of realism, and radical behaviorism with a generic philosophical version of pragmatism. These descriptors provide a very effective means of addressing the conspicuous and functional differences between mainstream experimental psychology (including most varieties of cognitive psychology) and the practices of behavior analysis. The former adopts the traditional view of a “real world” that lies beyond appearances but that, with proper “objective” methods, we may make more or less accurate inferences about this “real world” based on sense data. The latter takes a different view regarding the traditional objective-subjective distinction. As Baum notes,

Radical behaviorism, however, rejects the dualism between inner world and outer world. Instead, it considers behavior analysis to deal with one world and behavior to be found in that one world. (p. 31)

In pragmatism, ... if we were to make a distinction between subjectivity and objectivity at all, it would differ altogether from the distinction made in realism. You could say that the conflict between subjectivity and objectivity is for the pragmatist in favor of subjectivity. Since there need be no objective real world, "objectivity," if it has any meaning at all, at most would be a quality of the scientific inquiry. The move most consistent with pragmatism would be simply to drop the two terms altogether. (pp. 29–30)

Skinner (e.g., 1989) had rejected Watson's distinction between objective and subjective from his early years in psychology. As Baum notes, however, the term *objective* may nevertheless be interpreted in behavior analysis with respect to specific methodological issues (e.g., the practice of multiple independent observers and interobserver reliability may be interpreted in pragmatic terms as addressing the question of whose behavior is likely to be changing in an applied research context).

In the philosophical literature of pragmatism as well (although there are exceptions on particular issues), the traditional distinctions of objective–subjective, mind–body, fact–value, appearance–reality, and other dualisms that figure prominently in the traditional agenda of Western academic philosophy have been construed as pointless or useless linguistic contrivances (e.g., Murphy, 1990; Rorty, 1979, 1991). When Baum says, above, that on the one hand, "there need be no objective real world" (p. 30), and on the other hand that radical behaviorism "considers behavior analysis to deal with one world" (p. 31), Baum is addressing a property of both pragmatism and radical behaviorism that has been described by Rorty (1991; Murphy, 1990) as antirepresentationalism. That is, the notion of a world in which and with which humans and other creatures interact is not under dispute. What is under dispute is whether it makes sense to say that minds or particular vocabularies more or less accurately represent that

world. Rather than saying that, for example, the language of physics is a closer description of the way things "really are," we would say instead that the language of physics is a more useful, adaptive way of speaking and acting when there is an interest in prediction and control (for examples of Skinner's antirepresentationalism, see Leigland, 1999).

As Baum relates pragmatism to radical behaviorism, he also relates realism to methodological behaviorism. In his discussion of the latter, Baum notes that

Although they might be surprised to hear it, most experimental psychologists seem to be methodological behaviorists. They claim to study something inside—mind, memory, attitudes, personality, and so on—by making inferences about the internal world from external behavior, such as performance on estimation tasks, puzzles, paper-and-pencil tests, and questionnaires. Since experimental psychologists have no methods to study the inner world, however, they study outer behavior with objective methods. The only difference between this approach and methodological behaviorism is that the psychologists make the inferences about the inner world whereas the behaviorist would not. Early behaviorists like John B. Watson rejected such inferences because they considered them to be unscientific. (pp. 31–32)

Although Watson rejected such practices, the next generation of neobehaviorists developed and refined the inferential and theoretical practices of methodological behaviorism as they developed and tested their grand theories of learning. The S-R behavior theory of Clark Hull and the purposive or molar behaviorism of Edward Tolman became the general models for the next generation of cognitivists. That is, the general characteristics of methodological behaviorism (the study of overt "objective" or "verifiable" behavior, the use of operational definitions [at least for independent and dependent variables as in contemporary practice, although the mediational neobehaviorists attempted such definitions as well for their hypothetical constructs], the

use of inferential theory, and the testing of those theories by experiment) could be applied to any of the content areas of traditional psychology. Thus, today we can see methodological behaviorism as the mainstream view (e.g., presented in generic form in virtually all general introductory psychology textbooks) in general experimental psychology (exceptions may be found in humanistic psychology, behavior analysis, and a few minority perspectives in the larger field of cognition; e.g., Hergenhahn, 2005; Leigland, 1997).

Chapter 3 ("Public, Private, Natural, and Fictional") provides an excellent discussion of mentalism and private events from the standpoint of a radical behaviorist. The issues are too complex and wide-ranging for adequate treatment in this space, but the following passage summarizes a few of the central issues:

Everyday talk about mental things and events includes both private events and fictional things and events. Thinking and seeing are private and natural, whereas mind, will, psyche, personality, and ego are all fictional. When methodological behaviorists allowed public things and events and ruled out mental (in the everyday sense) things and events, they ruled out private events along with fictional things and events. In contrast, radical behaviorists allow all natural events, including both the public and the private, and rule out only the fictional. (pp. 39–40)

This passage nicely captures one of the central themes in Skinner's landmark paper, "The Operational Analysis of Psychological Terms" (1945), which introduced his radical behaviorism and its natural-science perspective on verbal behavior and private events. In this chapter, Baum lays out both the characteristics of mentalism (which implies a dualistic perspective, but which for practical purposes may be described as the practice of taking internal states or conditions to be the causes of behavior) and a series of objections to mentalism. Baum emphasizes the

radical behaviorist criticisms of mentalism on the pragmatic grounds that such explanatory practices produce ineffective and misleading accounts of behavior. Baum also includes a substantial discussion of the logical problems with mentalism described in the work of philosopher Gilbert Ryle, as well as a different perspective on mentalism and private events found in the molar behaviorism of Howard Rachlin.

Regarding the latter, Baum describes Rachlin's extension of a molar view of behavior (the view of behavior–environment interactions as extended in time, rather than as momentary, cause–effect points of contact) to the issue of private events in such a way that the very notion of *private events* may be unnecessary. The argument here is complex and somewhat controversial. Baum's discussion invites further scrutiny of Rachlin's views, and some issues are left open. For example, some of Baum's descriptions are seen in the following: "Rachlin lays much less emphasis upon private events than Skinner" (p. 50); "Rachlin's denial of private events" (p. 51); "[Rachlin] need neither deny nor affirm the existence of private events" (p. 51). From such passages it is not clear whether Rachlin asserts that a conception of private events is mostly unnecessary in behavior analysis or whether he is asserting that such a conception is explicitly counterproductive. The latter quotation might be taken for granted, as questions of "existence" are rarely if ever addressed among pragmatists in any case.

For someone like myself who has a special interest in the molar analysis of behavior (e.g., Baum, 2002; see also Hineline, 2001), I am not sure why a molar perspective would necessarily lead to Rachlin's view regarding first-person "subjective" terms as always referring to overt actions and activities in interaction with the environment over time (if

I am understanding the argument). Perhaps one of the problems lies with the term *events*. I am not sure why, from a molar perspective, we could not view private behaviors or bodily conditions (to which we have acquired the ability to respond verbally, as we can with overt actions or activities) as extended in time as we would with any other overt activities. I can recite the first few sentences of the Gettysburg Address out loud, or privately, or can switch between the two over time. In any case, Rachlin's alternative views on private events are worthy of continued attention and analysis by the behavior-analytic community, and Baum's treatment provides an intriguing introduction.

The Basics

Part 2, "A Scientific Model of Behavior," presents the basic concepts and terms of behavior analysis. Two chapters devoted to issues of reinforcement lead to a chapter on stimulus control, followed by two chapters on verbal behavior. As in the first edition, the chapter titles are designed to establish an important connection between the technical scientific topic under discussion in the chapter and a corresponding, ordinary-language psychological term. The only exception is the title of the first chapter in the section, which identifies the overarching scientific theme. Specifically, the chapter titles for the section are as follows: (chap. 4) "Evolutionary Theory and Reinforcement"; (chap. 5) "Purpose and Reinforcement"; (chap. 6) "Stimulus Control and Knowledge"; (chap. 7) "Verbal Behavior and Language"; (chap. 8) "Rule-Governed Behavior and Thinking." For readers new to behavior analysis, the connecting of technical terms to traditional culturally important concepts is an excellent way to establish the relevance of the basic analysis (although to distinguish this example from a different

point to be examined below, Baum is clear that the technical and everyday terms are not interchangeable or equivalent).

The first of the two chapters on reinforcement begins with a review of evolution by natural selection and moves from a discussion of reflexes and respondent conditioning to operant behavior and selection by consequences and to types of functional consequences. Much of the latter half of the chapter is devoted to the character of historical explanation in science, both in evolution and with respect to the concept of reinforcement history. This theme is developed further in the second chapter on reinforcement, in which historical explanation and reinforcement history provide the context for a discussion of a molar perspective on functional units of behavior. As these concepts are integrated within the larger evolutionary themes, Baum then compares the explanatory implications of the scientific perspective to the everyday-language mentalistic concept of *purpose*. Baum offers a functional interpretation of the term *purpose* in terms of three usages or meanings: purpose as function (compatible with the scientific view); purpose as cause (the standard mentalistic view); and purpose as feeling (as private events or self-reports, to be analyzed as behavior in context).

Chapter 6 provides an excellent description and discussion of discriminative stimulus control. The basic terms and examples are presented from a molar perspective and then are used in functional analytic interpretations of the language of "knowledge." This chapter then covers a great deal of traditional mentalistic ground from the standpoint of radical behaviorism. The topics examined include the following: procedural knowledge ("knowing how"), declarative knowledge ("knowing about"), lying, self-knowledge and private events, introspection, and scientific knowledge.

The conceptual tools of chapters 4, 5, and 6 are then put to use in addressing the broader field of verbal behavior in the next two chapters. Chapter 7 ("Verbal Behavior and Language") builds a careful and step-by-step case for viewing the phenomena of communication as another example of operant behavior. A variety of examples expands the central case by illustrating the effects of consequences and context in the control of verbal behavior (defined as operant behavior that requires a listener for its reinforcement). Major sections in this chapter include treatments of functional units and stimulus control, issues of meaning, and grammar and syntax. At every point the behavioral analysis is compared and contrasted with traditional mentalistic accounts of language. Of particular note is Baum's emphasis that the novelty or "generative nature" of language follows directly from the variation and selection dynamics of all operant behavior.

Chapter 8 ("Rule-Governed Behavior and Thinking") takes up the topic of rules and extends the analysis of verbal behavior into more traditional cognitive territory. The final section of this chapter is an excellent description of an operant analysis of problem solving and of thinking as rule-governed verbal behavior. The chapter begins with a distinction between rule-governed and implicitly shaped behavior, and both experimental and everyday examples of rule-governed behavior lead to a larger theme regarding contingencies of reinforcement. Baum describes rule-governed behavior as always involving two types of reinforcement relations: the *proximate* relations, or the immediate contingencies that maintain rule following, and the *ultimate* relations, or the long-term contingencies that serve as the basis for the abstraction of the rule. For example, children in the U.S. are generally instructed to wear shoes, and com-

pliance is reinforced (the proximate relation), although in the long run the practice of wearing shoes has a number of health benefits (the ultimate relation). Ultimate reinforcement relations are interpreted in terms of fitness; specifically, in terms of outcomes involving health, resources, relationships, and reproduction.

Here Baum once again ties a behavior-analytic interpretation of a mentalistic (and in this case an explicitly cognitive) theme directly to biological evolution. Such an achievement has yet to be realized in the theoretical fields of cognitive psychology or evolutionary psychology, because the theoretical constructions of cognition have no unambiguous evolutionary interpretation, whereas the operant concepts of behavioral variation and selection by consequences speak directly to evolutionary dynamics.

Social Issues

The concluding Part 3, "Social Issues," consists of six chapters of similar organization to the first edition, and are continued extensions and expansions of themes originally introduced by Skinner (e.g., 1953, 1971). The first two chapters in this series—chapter 9, "Freedom," and chapter 10, "Responsibility, Credit, and Blame"—examine these traditional concepts from a radical behaviorist perspective and outline the alternative scientific account offered by behavior analysis.

The next two chapters address the larger social context. Chapter 11, "Relationships, Management, and Government," provides an in-depth look at the varieties of social control, from the contingencies involved in ordinary human relationships, to issues of exploitation, equity, and the functions of countercontrol in government relations in general and democratic systems in particular.

Chapter 12, "Values: Religion and Science," examines the question of

shared standards of ethics and values. By shared standards, Baum is referring to “the idea that universal ethical standards or principles can be discovered by which we can explain people’s assertions about good and bad as an outcome of more than their particular situations” (p. 238). In using the Golden Rule as an example, Baum notes that “Evolutionary biologists also recognize altruism (being good to others) and reciprocity (considerations of long-term equity) as human universals” (p. 240). Baum goes on to examine the rationale presented by Christian apologist C. S. Lewis for concluding that such ubiquitous values speak to the influence of God. Baum’s scientific alternative is to look to evolutionary biology in addressing the same phenomena, and from which we may conclude, for example, that “Our short-term individual interests are often sacrificed on the altar of the greater good of the group, which turns out to be our own greater good in the long run. More precisely, the greater good in the long run is the greater good of one’s genes” (p. 247).

In the final two chapters, evolutionary and behavioral science perspectives are extended further in an examination of cultural evolution (chap. 13, “The Evolution of Culture”) and culture experimentation and design (chap. 14, “Design of Culture: Experimenting for Survival”). In the first of these chapters, Baum advances and extends Skinner’s (e.g., 1971) interpretations that “Evolution of culture occurs in a manner parallel to shaping of operant behavior and biological evolution—by variation coupled with selective transmission” (p. 281). The themes of variation, transmission, and selection of cultural practices as replicators are considered in some detail, and are then carried forward in chapter 14 for a discussion of the implication for deliberate cultural design. Acknowledging that this issue is likely the most controversial in all of Skinner’s writ-

ings, Baum takes great care in describing how the experimental method may be applied to the planning and evaluation of cultural practices. Skinner’s *Walden Two* (1976/1948) serves as an example, but only after a substantial clarification of what the book was designed to illustrate (i.e., the book is often mistaken to advocate certain practices, although the point of the book was that the practices were the result of experimentation). Common objections to cultural design are addressed, and Baum concludes by considering the possibility that “Although short-term consideration may dominate in our culture, we appear to be tending toward more control by long-term consequences” (p. 302). Such developments may be agonizingly slow and selective, but one of the side benefits of a molar view of behavior may be patience, for it seems to be true that “practices are increasingly being evaluated and compared with alternatives. Whether we wanted it or not, whether we thought it possible or not, we may be moving toward Skinner’s experimenting society anyway. Let us hope so” (p. 303).

Conclusions

The second edition of Baum’s *Understanding Behaviorism* contains many small improvements in the description of complex issues and in clarity of presentation. The further integration of evolutionary biology with all themes involving behavior-analytic science is also an advance. The new edition also places a greater emphasis on the molar analysis of behavior, but in keeping with a multi-scaled approach, local or small-scale temporal relations and contingencies are described as well.

With a book of such depth and scope, written with such care taken for accuracy, clarity, and readability, substantial criticisms are difficult to find, but one or two points may be worth consideration. First, some of

the expressions that promote readability for the general audience may introduce hazards when reaching the professional audience. Examples of this may be seen in Skinner's own writings, as when in a number of sources Skinner introduced the technical concept of reinforcement by relating the concept to the everyday concept of "reward." There can be no end to the confusion caused by relating the two concepts, as readers have often taken the term *reinforcement* to then mean that the consequences must be delivered by other people, that it is done intentionally, that everyone is aware of what is happening, that the behavior does not necessarily change, and so on.

Although Baum's description of reinforcement has none of these hazards, Baum does borrow an expression of Skinner's that has been the subject of criticism from many quarters over many years. In Baum's description of a scientific approach to values, a discussion of reinforcers and punishers is introduced as follows:

Skinner (1971) offered a simple rule of thumb: Things that are called good are positive reinforcers. Things that are called bad are punishers. Activities that are called good are those that are reinforced. Activities that are called bad are those that are punished. Some things and activities are good or bad because of the way our bodies are constructed. Health is good; illness is bad. Food and eating are good; pain and falling down are bad. Affection is good; rejection is bad. (p. 343)

Although this description provides a very broad conception of how the ordinary-language terms *good* and *bad* might be related to the effects of functional consequences, there may be hazards in the ways the relations are presented. For example, any philosopher would take such a passage as clearly and openly reductionistic and ontological. That is, the statement seems to saying that good things are actually "nothing but" reinforcers, and that is in fact what good things "really are." Such statements thus appear to be at odds

with the pragmatic perspective laid out in the early chapters of the book. Further, the expression indicates an easy transition from technical scientific terms to everyday-language terms. Ever since Chomsky's (1959) notorious polemic, critics of all sorts have used such statements by Skinner to contend that the technical vocabulary of behavior analysis is simply a hyped-up form of useless jargon that rides on the back of folk psychology (of course, it is in fact an effective scientific vocabulary that goes beyond ordinary language in a way similar to the vocabularies of physics, chemistry, and biology; e.g., Baum & Heath, 1992; Leigland, 1998). The points expressed in the passage above could be given an alternative expression that is compatible with the pragmatist view. It would undoubtedly take more space to do so, but would likely be well worth it in the long run.

A second minor point concerns the title. The potential problem with the term *behaviorism* is that it is much more ambiguous than it appears to most people. After Watson's relatively short-lived original version, a half dozen or so distinctly different varieties of behaviorism were developed. *Understanding Behaviorism* provides an excellent description of two of these—methodological behaviorism and radical behaviorism—but as the book indicates, very nearly all of experimental psychology may be described as a variety of behaviorism in the sense of the former term. Yet to most people in psychology, philosophy, linguistics, political science, and the general public, the term *behaviorism* indicates a singular, unified, monolithic view of some sort. When philosophers respond to the term they speak of philosophical behaviorism, which has no connection to behavior analysis. When cognitivists respond to the term, they describe a set of views that often appear to be part Watsonian and part the S-R learning theory of Clark Hull; these

have nothing to do with behavior analysis (but, ironically, do have connections to methodological behaviorism, which most cognitivists practice). Recommending a suitable alternative for the title is difficult, however. *Understanding Radical Behaviorism* or *Understanding Behavior Analysis* is unwieldy and probably would sound a bit odd to the general reader. Perhaps it is best as it stands, with the current subtitle adding context.

Baum's *Understanding Behaviorism: Behavior, Culture, and Evolution* has an organization and general coverage similar to Skinner's classic, *Science and Human Behavior* (1953). Baum's treatment of both science and human behavior offers a valuable update and extension to the issues originally described by Skinner (and also in Keller and Schoenfeld's earlier classic, *Principles of Psychology*, 1950).

The first sentence of *Understanding Behaviorism* is repeated in various forms throughout the book: "The central idea in behaviorism can be stated simply: *A science of behavior is possible*" (p. 3). Baum is too modest here, as his book demonstrates clearly that the science is fully underway. As the book may inform others of the ongoing development of the field, it may also remind behavior analysts of the scope and depth of behavior analysis as a comprehensive natural science approach to all behavioral phenomena, a scientific field that may yet achieve its fullest potential.

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